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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,917	12/13/2001	John M. Bergstrom	005222.00333	2229

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EXAMINER	
JARRETT, SCOTT L	

ART UNIT	PAPER NUMBER
3624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/021,917	BERGSTROM, JOHN M.	
	Examiner	Art Unit	
	SCOTT L. JARRETT	3624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _31 December 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,3-11,13-24,26-34,36-44,46,47,54 and 56-61_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,3-11,13-24,26-34,36-44,46,47,54 and 56-61_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This Non-Final Office Action is in response to Applicant's amendment filed December 31, 2008. Applicant's amendment amended claims 1,3-11,13-24,26-34,36-44,46,47 and 54 , canceled claims 2, 12, 25, 35, 45, 48-53 and 55 and added new claims 56-61. Currently Claims 1,3-11,13-24,26-34,36-44,46,47,54 and 56-61 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 31, 2008 has been entered.

Response to Amendment

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Response to Arguments

4. Applicant's arguments with respect to claims 1,3-11,13-24,26-34,36-44,46,47,54 and 56-61have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3-11,13-17, 20-24, 26-34, 36-44, 46, 47, 54 and 56-61are rejected under 35 U.S.C. 103(a) as being unpatentable over Zufryden, A Dynamic Programming Approach for Product Selection and Supermarket Shelf-Space Allocation (1986) in view of Bean et al., A Hybrid Algorithm for the Multiple Choice Knapsack Problem (1990) and further in view of Pisinger, A Minimal Algorithm for the Multiple-Choice Knapsack Problem (1994).

Regarding Claims 1, 11, 24, 34 and 44 Zufryden teaches a system and method that determines allocations in a business operation to maximize profit comprising (Abstract; Paragraphs 1-2, Page 413):

- a computer, processor and memory (microcomputer; Paragraph 3, Page 413; Last Paragraph, Page 421);

- collecting profit data for a plurality of classes in the business operation (Paragraph 5, Page 421), each class including an allocation having a cost function (Paragraphs 1, 5, Page 415; Paragraph 2, Page 417), the allocations being constrained by a space (shelf space, total space, etc.; Paragraph 2, Page 413; Paragraph 4, Last Paragraph Page 414; Paragraph 1, Page 416), each

class corresponding to a department of a business operation and each allocation belonging to a group consisting of physical and economic allocations (Paragraph 2, Page 413; Paragraphs 1-2, 5-7, Page 415);

- determining profit functions for the allocations from the profit data by (Page 415; Equations 1-4, 13, 14):

- determining demand distributions for each of the allocations from the profit data (Paragraphs 1-2, Page 415);

- determining spatial allotment for each department (Paragraphs 5-7, Page 415);

- determining each profit function from a corresponding demand function for the spatial allotment of each departments (Paragraphs 2, 5-7, Page 415);

- formulating a problem (objective function, model) to maximize profit from the profit and cost functions and a cost constraint (Paragraphs 2, 5-7, Page 415; Equations 1-4, 13, 14); and

- solving the problem to determine values for the allocations, by utilizing a recursive function that rewrites values into a solution (Paragraphs 2, 5-7, Page 415; Last Paragraph, Page 417; Tables 2-4).

While Zufryden teaches utilizing well known dynamic programming techniques to formulate and solve the profit maximization problem, having cost functions and constraints, Zufryden does not expressly teach formulating a multiple choice knapsack problem to maximize profit from the profit or that total floor area is a cost/constraint as claimed.

Bean et al. teach formulating a multiple choice knapsack problem to maximize profit from the profit and cost functions and a cost constraint (Paragraph 2, Page 2) and that total floor area is a cost/constraint utilized in the multiple choice knapsack problem (Paragraph 2, Page 2; Last Two Paragraphs, Page 9) in an analogous art of determining allocations in a business operation (Section 4.2, Pages 9-10).

More generally Bean et al. teach a method for determining allocations in a business operation to maximize profit comprising collecting profit data for a plurality of classes, each class including an allocation having a cost function, the allocations being constrained by a total floor area, each class corresponding to a department of the business operation, and each allocation belonging to a group consisting of physical and economic allocations (Paragraph 2, Page 2; Last Two Paragraphs, Page 9); determining a spatial allotment for each of the allocations from the profit data (Paragraph 2, Page 2); and recursively solve the MCKP (Paragraph 1, Page 5; Last Paragraph, Page 6; Section 3, Page 7; Paragraph 1, Page 8) wherein solutions are saved (Paragraph 1, Page 3).

It would have been obvious to one skilled in the art at the time of the invention that the system and method as taught by Zufryden would have benefited from utilizing any of a plurality of well known combinatorial problem solution techniques including but not limited to the multiple-choice knapsack problem algorithm as taught by Bean et al. since the claimed invention is merely

a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Zufryden does not expressly teach utilizing a Multiple-Choice Knapsack Problem algorithm, as discussed above, or subsequently solving the MCKP by utilizing a recursive function that rewrites values into a solution vector, the solution vector holding values determined from recursive running of the recursive function as claimed.

Pisinger, teach a method for formulating a Multiple-Choice Knapsack Problem to maximize profit from a profit and costs functions/constraints by utilizing a recursive function that rewrites values into a solution vector holding values determined from recursive running of the recursive function (Section 6 Finding the solution vector, Pages 14-15; Pseudo code, Page 16) in an analogous art of Knapsack Problem solving.

It would have been obvious to one skilled in the art at the time of the invention that the system and method as taught by the combination of Zufryden and Bean et al. would have benefited from utilizing a recursive function that rewrites values into a solution vector, the solution vector holding values determined from recursive running of the recursive function in view of the

teachings of Pisinger, since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding Claims 3-5, 13-15, 36-38, 46-47 and 54 Zufryden does not expressly teach that the demand distribution include probability distribution, Poisson distribution (model), Markov model and/or a normal distribution model as claimed.

Official Notice is taken that modeling demand using probability distributions (Poisson, Markov chains and the like) is old and very well known wherein such models enable users to model/account for/simulate dynamic and/or stochastic demand. An example of the use of such distributions in solving a dynamic knapsack problem can be found in at least Kleywegt et al., The Dynamic and Stochastic Knapsack Problem (1998).

It would have been obvious to one skilled in the art at the time of the invention that the system and method as taught by the combination of Zufryden, Bean et al. and Pisigner would have benefited from modeling the demand distributions using any of a plurality of well known stochastic and/or dynamic demand models/techniques including but not limited to probability distributions, Markov and/or Poisson in view of the teachings of official notice, since the

claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding Claims 6, 30 and 39 Zufryden teaches a system and method wherein the allocations include spatial allotments (Paragraph 2, Last Two Paragraphs, Page 415; Paragraphs 1, 4, Page 418; Tables 2-4).

Regarding Claims 7, 29 and 40 Zufryden teaches a system and method wherein the allocations include monetary allotments (cost, profit, etc.; Paragraphs 1, 5-7, Page 415; Tables 2-4).

Regarding Claims 8-10, 21-23, 31-33 and 41-43 Zufryden teaches a system and method wherein the cost constraint is greater than or equal to an inequality constraint, is an equality constraint and/or is an less than or equal to in equality constraint (Equations 5-7, 15-17).

Regarding Claim 17 Zufryden teaches a system and method wherein the spatial allotments include widths for the classes and the cost constraint is a width constraint (slots, rectangular grids; Paragraph 6, Page 415; Paragraph 1, Page 416; Tables 2-4).

Regarding Claim 20 Zufryden teaches a system and method wherein the spatial allotments include shelf spaces for the classes and the cost constraint is a shelf space constraint (Paragraphs 5-7, Page 415; Paragraph 1, Page 416; Tables 2-4).

Zufryden does not expressly that the spatial allotments include *floor spaces* for the classes and the cost constraint is a floor space constraint as claimed.

Bean et al. teach the spatial allotments include *floor spaces* for the classes and the cost constraint is a floor space constraint (Paragraph 2, Page 2; Last Two Paragraphs, Page 9) in an analogous art of determining allocations in a business operation (Section 4.2, Pages 9-10).

It would have been obvious to one skilled in the art at the time of the invention that the system and method Zufryden would have benefited from accounting for floor space in view of the teachings of Bean et al. since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding Claims 56 and 59 Zufryden teaches a system and method wherein a size of the solution vector is substantially equal to a value of the cost constraint (Paragraphs 1-2, 5-7, Page 415).

Regarding Claims 57 and 60 Zufryden does not expressly teach solving the MCKP or subsequently ordering the classes as claimed.

Pisinger teach a system and method further comprising ordering the plurality of classes by cost functions before solving the multiple choice knapsack problem (Section 4. Page 11).

It would have been obvious to one skilled in the art at the time of the invention that the system and method taught by the combination of Zufryden and Bean et al. would have benefited from ordering the plurality of classes by cost functions before solving the multiple choice knapsack problem in view of the teachings of Pisinger since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding Claims 58 and 61 Zufryden does not expressly teach removing items as claimed.

Pisinger teach removing a first item from a class if the item is dominated by a second item in the class, before solving the multiple choice knapsack problem, wherein the second item dominates the first item if the first and second item have substantially similar cost functions but the second item has a higher profit function (Section 4,1 Class Reduction, Pages 11-12; Pseudo Code, Page 13; Section 5.1 Reduction of states, Page 14) in an analogous art of solving knapsack problems for the purpose of removing/eliminating unpromising items (solutions) thereby improving the computational performance of the algorithm.

It would have been obvious to one skilled in the art at the time of the invention that the system and method as taught by the combination of Zufryden and Bean et al. would have benefited from removing (reducing, eliminating) items from a first class if the item is dominated by a second item in the class wherein the second item dominates the first item if the first and second item have substantially similar cost functions but the second item has a higher profit function in view of the teachings of Pisinger since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

7. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zufryden, A Dynamic Programming Approach for Product Selection and Supermarket Shelf-Space Allocation (1986) in view of Bean et al., A Hybrid Algorithm for the Multiple Choice Knapsack Problem (1990) and further in view of Pisinger, A Minimal Algorithm for the Multiple-Choice Knapsack Problem (1994) as applied to claims 16 above, and further in view of Johnson, Resource Allocation Models For Retail Planning and Display Space Allocation, and Optimal Allocation of Catalog Advertising Space (1982).

Regarding Claim 18 Zufryden does not expressly that the cost constraint is advertising space as claimed.

Johnson teach a system and method wherein the spatial allotments include advertising spaces for the classes and the cost constraint is an advertising space constraint (Paragraphs 2, 4-5) in an analogous art of determining allocations in a business operation to maximize profit.

It would have been obvious to one skilled in the art at the time of the invention that the system and method as taught by the combination of Zufryden, Bean et al. and Pisinger would have benefited from including advertising spaces for the classes and the cost constraint is an advertising space constraint in view of the teachings of Johnson, the result system and method enabling

businesses/users to address the well known retail planning problem of allocation of advertising space.

Further since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding Claim 19 Zufryden does not expressly teach that the spatial allotments including catalog spaces for the classes and the cost constraint is a catalog space constraint as claimed.

Johnson teach a system and method wherein the spatial allotments include catalog spaces for the classes and the cost constraint is a catalog space constraint (Paragraphs 2, 4-5) in an analogous art of determining allocations in a business operation to maximize profit.

It would have been obvious to one skilled in the art at the time of the invention that the system and method as taught by the combination of Zufryden, Bean et al. and Pisinger would have benefited from including catalog spaces for the classes and the cost constraint is a catalog space constraint in view of the teachings of Johnson, the result system and method enabling businesses/users to address the well known retail planning problem of allocation of advertising space.

Further since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Curhan, Shelf Space Allocation and Profit Maximization in Mass Retailing (1973), teach several well known methods for determining allocations in a business operation to maximize profit (shelf space allocation).

- Hansen et al., Product Selection and Space Allocation in Supermarkets (1979), teach a method for optimally selecting (allocating) a given set of products/assortment of products (classes) to be sold in a supermarket (business operation) and determining the amount of shelf space (floor area) to allocation to the group of products.

- Crostjens et al., A Model Optimizing Retail Space Allocations (1981), teach a method for determining allocations in a business operation to maximize profit comprising collecting profit data for a plurality of classes in the business operation, each class having a cost function, each class corresponding to a department of the business operation, the allocation being constrained by total floor are and each allocation belonging to the group consisting of physical and economical allocations, determining profit functions for each allocation from profit data by determining demand, spatial allotment and profit.

- Corstjens et al., A Dynamic Model for Strategically Allocating Retail Space (1983), teach a method that determines allocations (shelf space, advertising) in a business operation (retail store) to maximize profit.

- Armstrong et al., A Computational Study of a Multiple-Choice Knapsack Problem (1983) teaches a system and method for solving well known MCKP including the removing of items from classes based on item dominance as well as the generation of a solution vector.

- Dudzinski et al., An Algorithm for Multiple Choice Knapsack Problem (1984), teach a well known algorithm for the Multiple Choice Knapsack Problem (MCKP) comprising wherein a solution is recursively solved and one or more items from a class are removed (reduced) based on well known dominance rules/techniques.

- Buttle, Retail Space Allocations (1984) teach a method for optimizing the allocations of business classes within a business operation.

- Bean et al., Selecting Tenants in a Shopping Mall (1987) teach a system and method that determines the allocations in a business operations to maximize a profit comprising colleting and analyzing profit/revenue, cost and spatial allotment (square footage) for a plurality of classes in the business case operation (store, store types, etc.) including an allocation have a cost, physical and economic allocations.

- Bean, Multiple Choice Knapsack Functions (1987), teach a system and method for determining allocations in a business operation to maximize profit comprising: collecting profit data from a plurality of classes in the business operation, each class including an allocation having a cost function, the allocations being constrained by a total floor area (square footage of the mall), each class corresponding to a department (store) of the business operation

(mall) and each allocation belonging to a group consisting of physical and economic allocations; formulating a Multiple Choice Knapsack Problem to determine values for the allocations, recursively.

- Materllo et al., Knapsack Problems: Algorithms and Computer Implementations (1990) teach a plurality of methods for formulating knapsack problems including, but not limited to, formulating and solving a Multiple-Choice Knapsack Problem by utilizing a recursive function that rewrites values into a solution vector, the solution vector holding values determined from recursive running of the recursive function (Section 2.5.2, Page 32, Pseudo Code, Pages 34-35; Pseudo Code, Pages 172-173).

- Borin et al., A Model for Determining Retail Product Category Assortment and Shelf Space Allocation (1994), teach a system and method for determining allocations in a business operation to maximize profit comprising: determining profit functions from profit, cost, demand, spatial, physical and economic data wherein the allocations are constrained by shelf space.

- Kleywegt et al., The Dynamic and Stochastic Knapsack Problem (1998) teaches a method for solving well known knapsack problem wherein demand is modeled using well known probability distributions (e.g. Poisson, Markov).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT L. JARRETT whose telephone number is (571)272-7033. The examiner can normally be reached on Monday-Friday, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley Bayat can be reached on (571) 272-6704. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Scott L Jarrett/
Primary Examiner, Art Unit 3624